1934

Cost accounting system for the malleable iron industry

Malleable Founders' Society

COST ACCOUNTING SYSTEM
for the
MALLEABLE IRON INDUSTRY

Prescribed by the Board of Directors of the Malleable Founders' Society under Article V of the Code of Fair Competition for the Malleable Iron Industry and approved by the Administrator for Industrial Recovery on April 25, 1934

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Union Trust Bldg.
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Cost Accounting System for the Malleable Iron Industry

I — Cost Divisions

Costs of production shall be recorded under the following primary divisions:

Metal
Melting
Molding
Coremaking
Hard Iron Cleaning
Hard Iron Trimming
Annealing
Soft Iron Cleaning
Grinding and Finishing
Assorting and Shipping
Fixed Plant Charges
Administrative and Selling

II — Cost Accounts

Under the foregoing primary divisions of expense, the following minimum number of cost accounts shall be kept:

METAL:
- Pig Iron, Scrap, etc.

MELTING:
- Labor
- Fuel
- Supplies and Tools

MOLDING:
- Direct Labor
- Foundry Labor
- Supplies and Tools

COREMAKING:
- Direct Labor
- Indirect Labor
- Fuel
- Supplies and Tools

HARD IRON CLEANING:
- Labor
- Supplies

HARD IRON TRIMMING:
- Labor
- Supplies and Tools

ANNEALING:
- Labor
- Fuel
- Supplies and Tools
- Pots and Bottoms

SOFT IRON CLEANING:
- Labor
- Supplies and Tools

GRINDING AND FINISHING:
- Grinding Direct Labor
- Finishing Direct Labor
- Indirect Labor
- Supplies and Tools
- Grinding Wheels

ASSORTING AND SHIPPING:
- Labor
- Supplies and Tools

FIXED PLANT CHARGES:
- Power, Heat and Light
- Insurance
- Taxes
- Depreciation
- Plant Supervision and Clerical
- Laboratory
- Yard Labor, Watchmen and Janitors
- Repairs and Maintenance

ADMINISTRATIVE AND SELLING:
- Salaries
- Office Expense
- General and Traveling Expense

III — Job Costs

The procedure in the determination of the cost of an individual type or pattern of casting shall be as hereinafter described.

1. The cost of *Metal* for any given job shall be ascertained by multiplying the pounds of good castings produced by the unit cost of metal per pound of good production, varied by the oxidation and finishing loss applicable to the given job or class of work.

2. The cost of *Melting* for any given job shall be ascertained by multiplying the pounds of metal poured for the job by the cost to melt a pound of metal poured.

3. *Molding Direct Labor* (namely, the labor of all molders and helpers in putting up molds and in pouring when done by molders or helpers) shall be considered a direct cost item and shall be recorded by pattern numbers and charged directly to the job.

4. *Coremaking Direct Labor* (namely, the labor of all coremakers and helpers in making, assembling and pasting cores) shall be considered a direct cost item and shall be recorded by pattern numbers and charged directly to the job.

5. *Grinding Direct Labor* (namely, all labor of grinding and of shearing where gates are sheared instead of ground) shall be considered a direct cost item and charged directly to the job.

6. *Finishing Direct Labor* (namely, the labor of all finishing, such as straightening, gauging, drifting, drilling, reaming) shall be considered a direct cost item and charged directly to the job.

7. *Indirect Costs* shall be applied to individual jobs in the following manner:

(a) All costs of foundry labor, supplies and tools on the basis of pounds of metal poured;

(b) All costs of indirect core labor, fuel, supplies and tools on the basis of the weight of cores produced;

(c) All costs of Hard Iron Cleaning on the basis of the weight of good finished castings produced, applying where practicable the cost of tumbling against the tonnage tumbled and the cost of sand-blasting against the tonnage sand-blasted;

(d) All costs of Hard Iron Trimming on the basis of the molding direct labor when such costs are not determined by a weight classification;

(e) All costs of Annealing on the basis of weight of good finished castings produced;

(f) All costs of Soft Iron Cleaning on the basis of the weight of good finished castings produced, applying where practicable the cost of tumbling against the tonnage tumbled and the cost of sand-blasting against the tonnage sand-blasted;

(g) All indirect costs of Grinding and Finishing on the basis of the combined grinding and finishing direct labor, except grinding wheels which shall be applied against grinding direct labor only;

(h) All costs of Assorting and Shipping on the basis of the weight of good finished castings produced.

(i) In order to determine the amount of Fixed Plant Charges and Administrative and Selling Expense to be distributed, the following procedure shall be used:

"Normal Operations" of the individual producer for any semi-annual accounting period shall be determined by taking not more than sixty-five (65) per cent of the best six (6) consecutive months' production of such individual producer ("practical capacity") since January 1, 1924, and for any quarterly accounting period, one-half of such amount.

Determine the percentages which production of the individual producer for the last pre-

ceding semi-annual or quarterly accounting period is of normal operations for the same length of time. Distribute this percentage of total Fixed Plant Charges for the same accounting period, adjusted to a basis of normal operations as follows (when not severally departmentalized): 10% on the basis of pounds of metal poured (melting department expense), 40% on the basis of molding direct labor, 10% on the basis of coremaking direct labor, 10% on the basis of the combined grinding and finishing direct labor, and 30% on the basis of the weight of good finished castings produced, all for the same semi-annual or quarterly accounting period to determine the amount per ton or percentage, as the case may be, to be added to the respective departmental indirect costs.

Determine the percentage which production of the individual producer for the last preceding semi-annual or quarterly accounting period is of normal operations for the same length of time and distribute this percentage of the total Administrative and Selling Expense for the same accounting period, adjusted to the basis of normal operations, on the basis of manufacturing cost for the same semi-annual or quarterly accounting period.

Manual of Accounting

An amplification by the Board of Directors of the Malleable Founders' Society, under Article V of the Malleable Iron Code, of the foregoing Cost Accounting System and illustrations of the principles and procedure thereunder.

METAL

10 PIG IRON, SCRAP, ETC.:

To include the cost of all pig iron, iron and steel scrap, metals and alloys used in the mixture, including freight, and labor in unloading. Defective castings returned by customers shall be included at scrap value.

(In plants of the larger size, it is advisable to have a separate account for each kind of metal.)

MELTING DEPARTMENT

22 LABOR:

To include all labor identified with the melting of the iron, namely:

Delivering melting stocks and charging furnaces;
Furnacemen, firemen and coal wheelers;
Cleaning out ash pits and hauling out slag;
Cleaning sprue and gates;
Slag Mill operations;
Taking chunks from furnace to drop hammer;
Blacksmith labor in making and repairing pokers, grate bars, etc.;
Repairing and mudding bungs;
Relining furnaces and stacks, including new side walls, bottoms, tap holes and spouts.

23 FUEL:

To include the cost of all melting fuel used, including freight, and labor in unloading.

24 SUPPLIES AND TOOLS:

To include the cost of all supplies and small tools used at the melting furnace, such as fire brick, fire clay, fire sand, pokers, rakes, bars, miscellaneous supplies and tools.

31 DIRECT LABOR:

To include all labor of molders, in putting up molds, operating molding machines, green sand coremaking, core setting, pouring, when done by molders or helpers, lifting and carrying out molds.

32 FOUNDRY LABOR:

To include all labor in or for the foundry other than that of putting up molds, namely:

Pouring, when not done by molders or helpers;
Delivering metal to molders' floors;
Shifting mold weights, jackets or cases;
Dumping molds;
Breaking castings from gates;
Wetting sand;
Cutting and tempering sand;
Mixing sand and facing;
Wheeling flasks and sand;
Attending sand cellars, bins, and conveyors;
Wheeling out sprue and scrap castings to Cleaning Department and running magnetic separators and ash hoppers;
Assorting and oiling chills;
Mixing chill oil;
Stock-keepers of chills and flasks;
Making matches;
Cleaning floors for molders;
Removing shot;
Cleaning and sweeping gangways;
Wheeling boards, boxes and barrels;
Firing stoves;
Returning patterns to safe;
Operating monorail system when it applies to foundry labor operations;
Ordinary moving of molding machines about foundry and elsewhere;
Relining foundry ladles;
Making, altering or repairing patterns when

not chargeable to the customer or to an individual pattern number;
Carpenter labor in making and repairing flasks, jackets, bottom boards, etc.;
Conveying castings to cooling ovens;
Attending cooling furnaces;
Conveying castings to Hard Iron Cleaning Department.

34 SUPPLIES AND TOOLS:

To include the cost of all supplies and small tools used in the foundry, such as molding sand, facing, parting, chaplets, molders' tools, chills, flask lumber and supplies and pattern lumber and supplies when not chargeable to the customer or to an individual pattern number.

COREMAKING DEPARTMENT

41 DIRECT LABOR:

To include all labor of coremakers and helpers in making and assembling cores, both piece and day work, including green sand coremaking when made in the core room, and pasting when chargeable directly to the job.

42 INDIRECT LABOR:

To include all core room labor other than that of actually making cores, namely:
Sand wheelers;
Sand weighers;
Sand mixers and rosin grinders;
Pasters, when not chargeable directly to the job;
Painters;
Hook pasters, when not done by coremakers;
Loaders;
Coke wheelers;
Oven lighters;
Oven tenders;

Carriers and board collectors;
Inspectors;
Counter and tally boys;
Cleaners;
Sweepers;
Pulverizing old cores;
Scrap assorters;
Errand boys;
Storeroom helpers;
Shortage reporters;
Core plate collectors;
Dispatchers;
Assorters;
Wire cutters and straighteners;
Delivering cores to Molding Department;
Cleaning up department refuse and disposing of same.

43 FUEL:

To include the cost of all core fuel used, including freight, and labor in unloading.

44 SUPPLIES AND TOOLS:

To include the cost of all supplies and small tools used in the core room, such as core sand, core oil, rosin and pitch, compounds, wire, rods, core plates, coremakers' and laborers' tools, etc.

HARD IRON CLEANING DEPARTMENT

52 LABOR:

To include all labor in the Hard Iron Cleaning Department, namely:
Loading and unloading tumblers and sand-blast mills;
Pickling castings;
Brushing and cleaning castings which are neither tumbled or pickled;
Delivering casings to Hard Iron Trimming Department;
Cleaning up department refuse and disposing of same.

54 SUPPLIES AND TOOLS:

To include the cost of all supplies and small tools used in the Hard Iron Cleaning Department, such as stars, jacks, hose, sand-blast sand, small tools, etc.

HARD IRON TRIMMING DEPARTMENT

62 LABOR:

To include all labor in the Hard Iron Trimming Department, namely:

Trimming;
Inspecting;
Assorting;
Packing, when done by Trimmers;
Gauging and weighing castings;
Delivering good castings to the Annealing Department;
Assorting chills, stars, core wire, balls, gaggers, and returning same to respective departments when work is done by Trimming Department. (Note: If done elsewhere to be charged to the labor of the department doing the work.)
Moving defective castings from Trimming Department to designated delivery point;
Cleaning up department refuse and disposing of same.

64 SUPPLIES AND TOOLS:

To include the cost of all supplies and small tools used in the Trimming Department, such as chipping hammers, chisels, gauges, etc.

ANNEALING DEPARTMENT

72 LABOR:

To include all labor in the Annealing Department, namely:

Packing castings in pots;
Mudding pots;
Dumping pots;

Emptying and filling ovens;
Building up oven doors;
Charging truck operators and crane operators;
Mixing, tempering and screening packing;
Firing ovens and wheeling coal to ovens;
Removing ashes;
Disposing of old pots and bottoms;
Ordinary running repairs to ovens and stacks when made by masons and helpers;
Assorting and delivering castings to Soft Iron Cleaning Department;
Cleaning up department refuse and disposing of same.

73 FUEL:

To include the cost of all annealing fuel, including freight, and labor in unloading.

74 SUPPLIES AND TOOLS:

To include the cost of all supplies and small tools used in the Annealing Department, such as fire brick, fire clay, fire sand, packing materials, department and oven tools, etc.

74-P POTS AND BOTTOMS:

To include the cost of all purchased pots and bottoms used and the cost of producing pots and bottoms. This account should be credited with the receipts from the sale of scrap pots and bottoms.

SOFT IRON CLEANING DEPARTMENT

82 LABOR:

To include all labor in the Soft Iron Cleaning Department, namely:
Loading and unloading tumblers and sand-blast mills, and delivering castings to the Grinding and Finishing Department;
Pickling Castings;
Cleaning up department refuse and disposing of same.

84 SUPPLIES AND TOOLS:

To include the cost of all supplies and small tools used in the Soft Iron Cleaning Department, such as stars, jacks, hose, sand-blast sand, small tools, etc.

GRINDING AND FINISHING DEPARTMENT

91-G GRINDING DIRECT LABOR:

To include all direct labor of Grinding, including the shearing and milling of gates, the cost of which can be charged directly to the pattern number or job.

91-F FINISHING DIRECT LABOR:

To include all direct labor of Finishing, such as straightening, drifting, drilling, reaming and any other necessary finishing operation required in the production of a commercial casting, the cost of which can be charged directly to the pattern number or job.

92 INDIRECT LABOR:

To include all indirect labor in the Grinding and Finishing Department, namely:

Inspecting, when done by specialists;
Gauging;
Welding;
Cleaning up department refuse and disposing of same.

94 SUPPLIES AND TOOLS:

To include the cost of all supplies and small tools used in the Grinding and Finishing Department, such as press and drop hammer supplies, tapping and threading machine supplies, chisels and hammers, gauges, oil, waste, etc.

94-W GRINDING WHEELS:

To include the cost of grinding wheels and of milling and shearing fixtures and cutters.

ASSORTING AND SHIPPING DEPARTMENT

102 LABOR:

To include all labor in the Assorting and Shipping Department, namely:

Assorting;
Packing;
Weighing;
Trucking;
Loading Castings;
Inspecting, when work is performed with assorting operation;
Unloading and assorting defective castings returned;
Transferring castings to and from storage for shipment;
Loading castings on delivery trucks;
Moving defective castings to designated delivery point;
Cleaning up department refuse and disposing of same.

104 SUPPLIES AND TOOLS:

To include the cost of all supplies and small tools used in the Assorting and Shipping Department, such as sacks, or other containers, twine, needles, etc.

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106 DRAYAGE:

To include the cost of delivering castings to depots or to city customers, also switching of cars loaded for city customers, and incidental drayage on miscellaneous small items which cannot conveniently be charged to the cost of the commodity.

107 RETURNED CASTINGS AND ALLOWANCES:

To include the invoice price less scrap value of defective castings returned by customers and allowances to customers because of defective castings.

FIXED PLANT CHARGES

116 POWER, HEAT AND LIGHT:

To include the cost of all purchased current; all costs of labor, fuel, supplies and expense in producing power, heat and light; labor and materials in repairing boiler and engine room equipment, including air compressors, accumulators, pumps, generators, transformers, etc., located in engine room.

126 INSURANCE:

To include all premiums for insurance—fire, liability, boiler, tornado, etc.

Charge the account monthly and credit "Prepaid Insurance" account, the entry being one-twelfth of the annual expense.

146 TAXES:

To include all tax payments and assessments, other than Federal Income or Profits taxes.

Charge the account monthly and credit "Accrued Taxes" account, the entry being one-twelfth of the annual expense.

156 DEPRECIATION:

To include charges to cover the deterioration in the value of buildings and equipment due to wear and tear and obsolescence.

Charge the account monthly and credit "Plant and Equipment Depreciation Reserve" accounts, the basis being one-twelfth of the annual expense.

162 PLANT SUPERVISION AND CLERICAL:

To include the salary of the superintendent, general foreman, metallurgist, all departmental foremen and plant clerks.

172 YARD LABOR, WATCHMEN AND JANITORS:

To include all miscellaneous yard labor, excepting unloading; watchmen and janitors.

174 LABORATORY:

To include the salary of chemists; laboratory expenses; labor and expense incurred in testing products, etc.

175 REPAIRS AND MAINTENANCE:

To include, when not charged or allocated to departments, the cost of all labor and materials used in connection with the upkeep and maintenance of all buildings and plant equipment, other than power plant.

176 MISC. PLANT EXPENSE:

To include all forms of miscellaneous plant expense of a general nature not included elsewhere, such as water rent, employees' welfare, medical and hospital, etc.

ADMINISTRATIVE AND SELLING EXPENSE

270 SALARIES:

To include the salaries of general officers, office clerks and salaries and commissions of salesmen.

280 OFFICE EXPENSE:

To include all expense incidental to the office, including selling expense other than traveling.

290 GENERAL AND TRAVELING EXPENSE:

To include traveling expense of all officers and employees and all forms of expense of a general nature which cannot be included elsewhere, such as membership dues, donations, etc., not including Federal Income or Profits Taxes.

Procedure to Ascertain the Costs of Metal and of Melting

To ascertain the Metal and Melting costs per unit of good finished castings produced, for any pattern of casting of a given yield, the procedure illustrated on pages 20 and 21 shall be used.

Good finished castings produced shall be the shipping weight or the trimming room weight less soft iron scrap and less a finishing loss of 3%; unless, however, definite experience shows a lower percentage of loss, in which case the know percentage shall be used.

QUARTERLY STATEMENT OF METAL COSTS

Jan.-Mar. 1934

PER CENT OF MIXTURE		NET TONS	PRICE	AMOUNT
100.0	Metal Charged	2,727.27	$18.45	$50,310.00
8.0	Oxidation and Metal Loss	218.16	-----	---------
92.0	Metal Poured	2,509.11	20.05	50,310.00
42.5	Sprue and Hard Iron Scrap Recovered	1,159.50	18.45	21,390.00
49.5	Good Hard Iron Production	1,349.61	21.43	28,920.00
4.1	Soft Iron Scrap Recovered	110.49	18.45	2,040.00
1.4	Finishing Loss	39.12	-----	---------
44.0	Good Finished Castings Produced	1,200.00	22.40	26,880.00

Oxidation and Metal Loss, including finishing loss, per ton of Metal Charged (257.28 tons @ 18.45 ÷ 2727.27)----------$1.740

Melting Department Cost, per ton of Metal Charged ($12,600.00, see page 22, ÷ 2727.27 tons)----------$4.620

COMPUTATION OF METAL AND MELTING COSTS AT DIFFERENT YIELDS

YIELD (% OF METAL CHARGED)	OXIDATION AND METAL LOSS (a)	COST OF METAL CHARGED PER NET TON	METAL COST PER TON OF GOOD FINISHED CASTINGS PRODUCED	MELTING COST PER TON OF GOOD FINISHED CASTINGS PRODUCED (b)
25	$6.96	$18.45	$25.41	$18.48
26	6.69	18.45	25.14	17.76
27	6.44	18.45	24.89	17.11
28	6.21	18.45	24.66	16.50
29	6.00	18.45	24.45	15.93
30	5.80	18.45	24.25	15.40
31	5.61	18.45	24.06	14.90
32	5.43	18.45	23.88	14.43
33	5.27	18.45	23.72	14.00
34	5.12	18.45	23.57	13.58
35	4.97	18.45	23.42	13.20
36	4.83	18.45	23.28	12.83
37	4.70	18.45	23.15	12.48
38	4.57	18.45	23.02	12.16
39	4.46	18.45	22.91	11.84
40	4.35	18.45	22.80	11.55
41	4.24	18.45	22.69	11.26
42	4.14	18.45	22.59	11.00
43	4.04	18.45	22.49	10.74
44	3.95	18.45	22.40	10.50
45	3.86	18.45	22.31	10.26
46	3.78	18.45	22.23	10.04
47	3.70	18.45	22.15	9.82
48	3.62	18.45	22.07	9.62
49	3.55	18.45	22.00	9.42
50	3.48	18.45	21.93	9.24
51	3.41	18.45	21.86	9.05
52	3.34	18.45	21.79	8.88
53	3.28	18.45	21.73	8.71
54	3.22	18.45	21.67	8.55
55	3.16	18.45	21.61	8.40
56	3.10	18.45	21.55	8.25
57	3.05	18.45	21.50	8.10
58	3.00	18.45	21.45	7.96
59	2.95	18.45	21.40	7.83
60	2.90	18.45	21.35	7.70
61	2.85	18.45	21.30	7.57
62	2.80	18.45	21.25	7.45
63	2.76	18.45	21.21	7.33
64	2.72	18.45	21.17	7.21
65	2.67	18.45	21.12	7.10

Yield of any given job, in percentage of metal charged, is obtained by dividing the pounds of good production by the pounds of metal poured, increased by the average oxidation and metal loss, including finishing loss.

Example - 18,000 lbs. metal poured, 9,000 lbs. good finished castings produced:

$$18{,}000 \div 90.6\ (100 - 9.4) = 19{,}868$$

$$9{,}000 \div 19{,}868 = 45\%\ \text{yield}$$

(a) Obtained by dividing the cost of the oxidation and metal loss per net ton of metal charged ($1.740) by the given yield.

(b) Obtained by dividing the melting cost per net ton of metal charged ($4.620) by the given yield.

QUARTERLY COST STATEMENT

Good Finished Castings Produced 1200 Tons. Jan. - Mar. 1934

	AMOUNT	COST PER TON	
		Actual	Normal
METAL COST	$26,880.00	$22.40	$22.40
MELTING DEPARTMENT:			
Labor	3,960.00	3.30	3.30
Fuel	6,480.00	5.40	5.40
Supplies and Tools	2,160.00	1.80	1.80
Total	12,600.00	10.50	10.50
MOLDING DEPARTMENT:			
Direct Labor	18,000.00	15.00	15.00
Foundry Labor	9,600.00	8.00	8.00
Supplies and Tools	3,600.00	3.00	3.00
Total	31,200.00	26.00	26.00
COREMAKING DEPARTMENT:			
Direct Labor (cores used 61,000 lbs.)	4,800.00	4.00	4.00
Indirect Labor	2,520.00	2.10	2.10
Fuel	600.00	.50	.50
Supplies and Tools	3,600.00	3.00	3.00
Total	11,520.00	9.60	9.60
HARD IRON CLEANING DEPARTMENT:			
Labor	1,200.00	1.00	1.00
Supplies and Tools	480.00	.40	.40
Total	1,680.00	1.40	1.40
HARD IRON TRIMMING DEPARTMENT:			
Labor	2,520.00	2.10	2.10
Supplies and Tools	120.00	.10	.10
Total	2,640.00	2.20	2.20
ANNEALING DEPARTMENT:			
Labor	3,600.00	3.00	3.00
Fuel	3,720.00	3.10	3.10
Supplies and Tools	960.00	.80	.80
Pots and Bottoms	4,080.00	3.40	3.40
Total	12,360.00	10.30	10.30
SOFT IRON CLEANING DEPARTMENT:			
Labor	1,200.00	1.00	1.00
Supplies and Tools	720.00	.60	.60
Total	1,920.00	1.60	1.60

GRINDING AND FINISHING DEPARTMENT:			
Grinding Direct Labor	3,840.00	3.20	3.20
Finishing Direct Labor	2,400.00	2.00	2.00
Indirect Labor	1,680.00	1.40	1.40
Supplies and Tools	720.00	.60	.60
Grinding Wheels	1,680.00	1.40	1.40
Total	10,320.00	8.60	8.60
ASSORTING AND SHIPPING DEPARTMENT:			
Labor	3,600.00	3.00	3.00
Supplies and Tools	480.00	.40	.40
Total	4,080.00	3.40	3.40
Drayage	720.00	.60	.60
Returned Castings and Allowances	2,400.00	2.00	2.00
FIXED PLANT CHARGES:			(b)
Power, Heat and Light	3,120.00	2.60	1.95
Insurance	1,440.00	1.20	.90
Taxes	1,200.00	1.00	.75
Depreciation	7,200.00	6.00	4.50
Plant Supervision and Clerical	3,960.00	3.30	2.48
Yard Labor, Watchmen and Janitors	600.00	.50	.37
Laboratory	240.00	.20	.15
Repairs and Maintenance	3,600.00	3.00	2.25
Miscellaneous Plant Expense	1,320.00	1.10	.83
Total	22,680.00	18.90	14.18
ADMINISTRATIVE AND SELLING EXPENSE:			(b)
Salaries	5,640.00	4.70	3.52
Office Expense	1,440.00	1.20	.90
General and Traveling Expense	4,920.00	4.10	3.08
Total	12,000.00	10.00	7.50
Total Cost of Good Finished Castings	153,000.00(a)	127.50	120.28

Practical Capacity per Month (Average monthly production for the best six consecutive months since January 1, 1924)	.889 Tons
Practical Capacity per Quarter	2667 Tons
Normal Production per Quarter (60% of Capacity)	1600 Tons
Production, Jan. - March	1200 Tons
Rate of Operations (% of Normal)	75

(a) This amount should be traceable to and should agree with the accounts as found in the General Ledger.

(b) Divisor: 1600 Tons

Note: If Fixed Plant Charges and Administrative and Selling Expense are abnormally low due to a more or less continuous low rate of operation, the amounts should be increased to a figure which would represent expenditures if production were normal.

Procedure in the Determination of Indirect Costs and of Overhead Rates

DIRECT COSTS		
Metal (good production, 2,400,000 lbs.)		$26,880.00
Melting (metal poured, 5,018,220 lbs.)		12,600.00
Molding Direct Labor	$18,000.00	
Coremaking Direct Labor	4,800.00	
Grinding Direct Labor	3,840.00	
Finishing Direct Labor	2,400.00	29,040.00
INDIRECT COSTS		
Molding (**26.3 cents per 100 lbs. metal poured**)	13,200.00	
Coremaking (**$1.10 per 100 lbs. of cores used**)	6,720.00	
Trimming (**14.7% of Molding Direct Labor**)	2,640.00	
Grinding Wheels (**43.8% of Grinding Direct Labor**)	1,680.00	
Grinding and Finishing (**38.5% of Grinding and Finishing Direct Labor**)	2,400.00	
Cleaning, Annealing, Assorting and Shipping, Drayage, Returned Castings and allowances (**96.5 cents per 100 lbs. of good castings**)	23,160.00	49,800.00
FIXED PLANT CHARGES		
On Metal Poured (10%) (**3.4 cents per 100 lbs.**)	1,701.00	
On Molding Direct Labor (40%) (**38.0% of Molding Direct Labor**)	6,804.00	
On Coremaking Direct Labor (10%) (**35.4% of Core Direct Labor**)	1,701.00	
On Grinding and Finishing Direct Labor (10%) (**27.3% of Grinding and Finishing Direct Labor**)	1,701.00	
On Weight of Good Castings Produced (30%) (**21.3 cents per 100 lbs. of good castings**)	5,103.00	
		17,010.00
MANUFACTURING COST		135,330.00
Administrative and Selling (**6.65% of Manufacturing Cost**)		9,000.00
TOTAL COST (normal)		144,330.00
Unabsorbed Overhead		8,670.00
TOTAL COST (actual)		$153,000.00

Cost Record Forms

It is not a requisite of the approved Cost Accounting System that the form of records for gathering cost data be uniform. Forms of records, however, should be such as to gather and exhibit the results with the minimum amount of clerical labor and with proof of the accuracy of the work.

Suggested forms of certain book and card records are shown as illustrative of the accounting principles prescribed, the forms comprising the following:

Molder's Weekly Production Record
Coremaker's Weekly Production Record
Summary Cost Record
Cost Card
Cost Estimate Sheet

MOLDER'S WEEKLY PRODUCTION RECORD

Amount $ 30.87

Molder J. Smith No. 20 Week ending Jan 7 1934

CUSTOMER			Roe + Co																				
PATTERN NO.			R-2346																				
PCS. ORDERED			2000																				
PCS. IN MOLD			4																				
DATE	TOTAL MOLDING HOURS P.W.	TOTAL MOLDING HOURS D.W.	MOLDS POURED	PIECES GOOD	PIECES ALLOW	PIECES BAD	POUNDS GOOD	MOLDING HOURS	MOLDS POURED	PIECES GOOD	PIECES ALLOW	PIECES BAD	POUNDS GOOD	MOLDING HOURS	MOLDS POURED	PIECES GOOD	PIECES ALLOW	PIECES BAD	POUNDS GOOD	MOLDING HOURS
Jan 2			102	380	8	20	760	8												
3			110	408	2	30	816	8												
4			117	416	6	46	832	8												
5			115	412	4	44	824	8												
6			116	420	2	42	840	8												
TOTAL			560	2036	22	182	4072	40												
RATE			5 1/4 molds @ 6¢ 30.87																	
AMOUNT																				

CUSTOMER																							
PATTERN NO.																							
PCS. ORDERED																							
PCS. IN MOLD																							
DATE	TOTAL MOLDING HOURS P.W.	TOTAL MOLDING HOURS D.W.	MOLDS POURED	PIECES GOOD	PIECES ALLOW	PIECES BAD	POUNDS GOOD	MOLDING HOURS	MOLDS POURED	PIECES GOOD	PIECES ALLOW	PIECES BAD	POUNDS GOOD	MOLDING HOURS	MOLDS POURED	PIECES GOOD	PIECES ALLOW	PIECES BAD	POUNDS GOOD	MOLDING HOURS
TOTAL																				
RATE																				
AMOUNT																				

COREMAKER'S WEEKLY PRODUCTION RECORD

Amount $ 3 3/35

Coremaker... Ben Polaski ..... No... 64 .....

Week ending..... Jan 7 .... 1934..

CUSTOMER			Roe+Co		B.M.Co.		Ajax		E.J.Work												
PATTERN NO.			R2346		9680		F90		RS910												
CORE LETTER																					
CORES ORDERED			4400		3600		880		1200												
DATE	TOTAL CORE HOURS P.W.	TOTAL CORE HOURS D.W.	CORES MADE	HOURS	CORES MADE	HOURS	CORES MADE	HOURS	CORES MADE	HOURS	CORES MADE	HOURS	CORES MADE	HOURS	CORES MADE	HOURS	CORES MADE	HOURS	CORES MADE	HOURS	
Jan 2	8		1000		1200																
3	8		1200		1100																
4	8		880		1300		80														
5	8		760				410														
6	8		560				390		100												
TOTAL	40		4400		3600		880		100												
RATE			30¢		25¢		10¢		35¢												
AMOUNT			13.20		9.00		8.80		35¢												
CUSTOMER																					
PATTERN NO.																					
CORE LETTER																					
CORES ORDERED																					
DATE	TOTAL CORE HOURS P.W.	TOTAL CORE HOURS D.W.	CORES MADE	HOURS	CORES MADE	HOURS	CORES MADE	HOURS	CORES MADE	HOURS	CORES MADE	HOURS	CORES MADE	HOURS	CORES MADE	HOURS	CORES MADE	HOURS	CORES MADE	HOURS	
TOTAL																					
RATE																					
AMOUNT																					

SUMMARY COST RECORD

Customer: Roe + Co.
Pattern No.: R-2346
Class of Work: Automotive

Core Wt. Per Casting: 1.0
Core Wt. Per Mold: 4.0
Core Ratio (%): 5.0

Pounds Metal Poured Per Mold: 14.7
Pounds Per Casting: 2.0
Pieces Per Mold: 4

- [x] Bench
- [ ] Squeezer
- [ ] Plate
- [ ] Floor
- [ ] Machine

WEEK ENDING	MOLDER	MOLDING HOURS	MOLDS POURED	HARD IRON		POUNDS FINISHING LOSS	POUNDS SOFT IRON SCRAP	POUNDS GOOD PRODUCTION	DIRECT LABOR COSTS			
				PIECES GOOD	POUNDS GOOD				MOLDING	COREMAKING	GRINDING	FINISHING
Jan 7	J. Smith	40	560	2036	4072	81	16	3975	3087	1320	1018	407

COST CARD

Customer Roe & Co. Core Wt. per Casting 1.0 Lbs. Metal Poured per Mold 14.7

Pattern No. R-2346 Core Wt. per Mold 4.0 Wt. of Casting 2.0

Class of Work Automotive Core Ratio 50 Pcs. per Mold 4

	Jan. 1934							
Pounds Good Production	3975							
Pounds Metal Poured	8232							
Yield (% Good to Metal Charged)	44							
Pounds Cores Used	2240							
Production per Molder per hour (lbs.)	99							
COSTS OF PRODUCTION:	Amt.	Per 100#	Amt.	Per 100#	Amt.	Per 100#	Amt.	Per 100#
	$	$						
Metal	44.52	1.120						
Melting	20.87	.525						
Direct Labor:								
Molding	30.87	.777						
Coremaking	13.20	.332						
Grinding	10.18	.256						
Finishing	4.07	.102						
Indirect Costs:								
Molding	21.65	.545						
Coremaking	24.64	.620						
Trimming	4.54	.114						
Grinding Wheels	4.46	.112						
Grinding and Finishing	5.49	.138						
Cleaning, Annealing, etc.	38.36	.965						
Fixed Plant Charges:								
On Metal Poured	2.80	.070						
On Molding Direct Labor	11.73	.296						
On Coremaking Direct Labor	4.67	.117						
On Grinding and Finishing Direct Labor	3.89	.098						
On Weight Good Production	8.47	.213						
MANUFACTURING COST	254.41	6.400						
Administrative and Selling	16.92	.425						
TOTAL COST	271.33	6.825						

Customer Roe & Co.

Pattern No. R-2346

Pieces	Lbs. per Casting	Pcs. per Mold	Lbs. per Mold	Wt. of Sprue
2000	2.0	4	8.0	7.0
Molds	**% Loss**	**Molds to Make**	**Gross Wt. per Mold**	**Lbs. Metal to Pour**
500	H. I. not paid for 6 H. I. paid for 2 S. I. paid for 2	556	15.0	8340

Total Good Production 4000 Lbs. 2.00 Tons

Yield (on Metal Poured) 48% (on Metal Charged) 44%

Pattern Equipment:

Plate [√] Machine [ ] Gated [ ] Loose [ ]

Method of Molding:

Bench [√] Squeezer [ ] Machine [ ] Floor [ ]

Molds per Molder per Hour 12 Per Day 96

Good Production per Hour (lbs.) 96 Per Day 768

Molding: Molds 521 Rate 6¢ Amt. 31.26

Cores: Molds 556 Cores per ~~Casting~~ 4

Core Wt. Per Castings 1.0 Per Mold 4.0 Total Wt. 2224

Cores Required ~~1112~~ 2224)

Breakage (5%) ~~56~~ 111) Rate ~~1.20~~ Amt. 14.05

Grinding:

Pieces 2041 Rate per 100 50¢ Amt. 10.21

Finishing:

Pieces 2041 Rate per 100 20¢ Amt. 4.08

ESTIMATE

Date _____ 193

Class of Work _____

	Amount	Per 100#	
Metal (at 44% yield)	44.80	1	120
Melting (at 44% yield)	21.00		525
Direct Labor:			
Molding	31.26		782
Coremaking	14.05		351
Grinding	10.21		255
Finishing	4.08		102
Indirect Costs:			
Molding (26.3¢ per 100 lbs. Metal Poured)	21.93		548
Coremaking (1.10 per 100 lbs. Cores Used)	24.46		611
Trimming (14.7% of Molding Direct Labor)	4.60		115
Grinding Wheels (43.8% of Grinding Direct Labor)	4.47		112
Grinding and Finishing (38.5% of Grinding and Finishing Direct Labor)	5.50		138
Cleaning, Annealing, etc. (96.5¢ per 100 lbs.)	38.60		965
Fixed Plant Charges:			
On Metal Poured (3.4¢ per 100 lbs.)	2.84		071
On Molding Direct Labor (38.0%)	11.88		297
On Coremaking Direct Labor (35.4%)	4.97		124
On Grinding and Finishing Direct Labor (27.3%)	3.90		098
On Weight Good Production (21.3¢ per 100 lbs.)	8.52		213
MANUFACTURING COST	257.07	6	427
Administrative and Selling (6.65% Mfg. Cost)	17.10		427
TOTAL COST	274.17	6	854

Depreciation

Depreciation shall be figured on no greater value than the cost of buildings and equipment with the following exceptions; (a) in case of recent acquisition of plant and equipment at an abnormally low price, depreciation shall be calculated on a fair replacement value, for the portion of the plant in operation; and (b) where the assets of the industry have been already fully depreciated, an allowance for depreciation based on the fair replacement value of the property shall be added. No depreciation on buildings completely closed and equipment completely inoperative should be included in cost.

The first step necessary to provide for proper depreciation is to departmentize building and equipment values. The next step is to take each kind of building and equipment and figure its proper depreciation.

It is the experience of many members of the Industry that the annual rates for depreciation, for the principal kinds of malleable iron foundry buildings and equipment, shown below are necessary to fully maintain plant and equipment values. These rates, generally, have been recognized by the Bureau of Internal Revenue and their use is recommended. However, a member may use other rates, provided such rates conform to the preceding paragraphs.

	Per cent.
BUILDINGS:	
Concrete	2½
Brick	3
Sheet Iron	10
MELTING DEPARTMENT EQUIPMENT:	
Melting Furnaces and Apparatus	7½
Sprue Mill and Slag Washer	15
Laboratory Equipment	10
Crane	10
MOLDING DEPARTMENT EQUIPMENT:	
Hand Squeezers	15
Air Molding Machines	15

CORE DEPARTMENT EQUIPMENT:

Core Ovens and Apparatus	7½
Core Machines	15
Sand Mixer	20
Benches, Racks, Trays, Trucks	10

HARD IRON CLEANING DEPARTMENT EQUIPMENT:

Tumbling Barrels, with motor, shafting and belting	15
Sand-Blast Barrels and Tables, with motor shafting and belting	30
Dust Arrester	10

TRIMMING AND INSPECTING DEPARTMENT EQUIPMENT:

Benches, Scales, Trucks	10
Emery Wheel Stands, with motor, shafting and belting	10

ANNEALING DEPARTMENT EQUIPMENT:

Annealing Ovens and Apparatus	10
Annealing Trucks	20
Crane	10

SOFT IRON CLEANING DEPARTMENT EQUIPMENT:

Tumbling Barrels, with motor, shafting and belting	15
Sand-Blast Barrels and Tables, motor shafting and belting	30
Dust Arrester	10

FINISHING DEPARTMENT EQUIPMENT:

Emery Wheel Stands, Drop Hammers, Lathes, Drill Presses, Air Choppers, Milling Machines, Threading Machines, etc., with motor, shafting and belting	10

ASSORTING AND SHIPPING DEPARTMENT EQUIPMENT:

Sorting Tables, Trucks, Scales, etc.	10
Automobile Trucks	20

POWER PLANT EQUIPMENT:

Steam Boiler, Generator, Air Compressor, Steam Piping, Electric Wiring, etc.	7½